

CLAIMS

What is claimed is:

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- 1 1. An active pixel sensor circuit comprising:
- 2 a photodetector;
- 3 a reset transistor connected between the photodetector and a first bus;
- 4 a snapshot transistor having a node connected to the photodetector;
- 5 a driver transistor connected to a second bus and the snapshot
- 6 transistor; and
- 7 an isolation transistor connected between the driver transistor and a
- 8 column bus.
- 1 2. The active pixel sensor circuit of Claim 1, wherein the transistors are
- 2 MOSFETs.
- 1 3. The active pixel sensor circuit of Claim 2, wherein a tapered reset signal is
- 2 applied to the reset transistor in order to reset the photodiode.
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- 1 4. The active pixel sensor circuit of Claim 3, wherein a charge from the
- 2 photodiode is transferred to a gate capacitance of the driver transistor via the snapshot
- 3 transistor.
- 1 5. The active pixel sensor circuit of Claim 4, wherein the reset transistor
- 2 discharges any charge left on the photodetector along with any charge on the gate of
- 3 the driver transistor during a reset operation.
- 1 6. The active pixel sensor circuit of Claim 5, wherein the reset transistor is
- 2 disabled during a signal integration mode and a snapshot image capture mode.
- 1 7. The active pixel sensor circuit of Claim 6, wherein, after snapshot image
- 2 capture, the reset transistor is enabled in order to drain any unwanted charge that is
- 3 generated after the integration mode.

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1 8. The active pixel sensor circuit of Claim 7, further comprising a column
2 buffer connected to the column bus.

1 9. The active pixel sensor circuit of Claim 8, further comprising a row driver
2 circuit connected to the driver transistor.

1 10. An active pixel sensor circuit comprising:
2 photodetector means for converting light into an electrical signal;
3 image snapshot means connected to the photodetector for transferring
4 the signal from the photodetector;
5 reset means for resetting the photodetector after the image has been
6 transferred;
7 amplifier means for amplifying the signal from the snapshot means;
8 and
9 isolation means for isolating the circuit from a column bus.

1 11. A method for snapshot image formation in an active pixel sensor, the
2 method comprising:
3 resetting a photodetector;
4 integrating a charge signal on the photodetector;
5 transferring the charge signal from the photodetector to a capacitance
6 via a snapshot transistor; and
7 reading out the signal to a bus.

1 12. The method of Claim 11, wherein the photodetector is reset with a tapered
2 clock signal.

5.6 A2 1 13. The method of Claim 12, wherein the capacitance is a gate capacitance on
2 a driver transistor.

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1 14. A CMOS imager array comprising a plurality of pixels, each pixel
2 comprising:
3 a photodetector;
4 a reset MOSFET having a source connected to the photodetector, a
5 gate connected to a reset input signal, and a drain connected to a first bus;
6 a snapshot MOSFET having a source connected to the photodetector
7 and a gate connected to a snapshot signal;
8 a driver MOSFET having a drain connected to a second bus and a gate
9 connected to a drain of the snapshot MOSFET;
10 an isolation MOSFET having a drain connected to a source of the
11 driver MOSFET, a gate connected to an access signal, and a source connected to a
12 column bus.

1 15. The imager array of Claim 14, wherein the reset, snapshot, driver and
2 isolation MOSFETs are all of the same polarity.

1 16. The imager array of Claim 15, further comprising a row driver circuit
2 connected to the second bus.

1 17. The imager array of Claim 16, further comprising a column buffer circuit
2 connected to the column bus.

1 18. A CMOS imager array having a plurality of active pixel cells, each cell
2 having a photodetector, the improvement comprising a snapshot transistor to transfer a
3 charge from the photodetector to a driver transistor, when a snapshot signal is
4 received.